

# Empirical Analyses of Potential Competitive Effects of a Horizontal Merger: The FTC's Cruise Ships Mergers Investigation

Mary T. Coleman, David W. Meyer, and David T. Scheffman<sup>1</sup>

## I. Introduction

In this paper we provide an overview of how economists at the Federal Trade Commission (FTC) assess the potential competitive effects of mergers and provide, as a specific example, some information about the analyses developed in connection with the FTC's cruise ships merger investigation. Because of space limitations and confidentiality issues, we can only highlight major issues and provide some examples of the sorts of analyses that FTC economists conducted in connection with this investigation. Nonetheless, we believe that industrial organization economists should find this paper of interest because it represents a comprehensive discussion of what FTC economists "do" in a merger investigation and elaborates by discussing a recent example. We begin with an overview of the economic questions regularly addressed in merger investigations and discuss some approaches to answering those questions. We next discuss some of the economic analyses we used in connection with the FTC's investigation of proposed mergers of cruise ship companies, including some specific examples of some of the quantitative analyses. Although in our discussion of the cruise ships mergers we briefly discuss analyses relevant to evaluation of potential unilateral effects theories, we focus primarily on approaches relevant to a determination of whether the proposed mergers would create or strengthen coordinated interaction, as this is a relatively undeveloped area in the empirical industrial organization literature.

## II. Overview of Merger Analysis

In merger investigations, the FTC follows the analysis set forth in the *Horizontal Merger Guidelines*.<sup>2</sup> The *Guidelines* lay out a five step approach to assessing the competitive implications of a merger: (1) define the market; (2) measure concentration (as a screen for determining whether further investigation is warranted); (3) identify potentially viable theories of anticompetitive effects; (4) assess whether the potential for entry (due to the absence of significant barriers-to-entry) would make anticompetitive effects unlikely; and (5) assess potential efficiencies. It is important to recognize, however, that each step in the analysis is not conducted in isolation but rather the steps interact with one another and this interaction impacts

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<sup>1</sup> Dr. Meyer is a staff Economist at the Federal Trade Commission. Dr. Coleman is the Deputy Director for Antitrust in the Bureau of Economics at the Federal Trade Commission. Dr. Scheffman is the Director of the Bureau of Economics at the Federal Trade Commission. The views and opinions expressed in this paper are those of the authors and are not necessarily those of the Commission or any individual Commissioner. We thank Michelle Kambara, Karl Kindler, and Stephen Tuohy for excellent research assistance, and our colleagues James Ferguson, Jeffrey Fischer, Elizabeth Schneirov, Charlotte Manning, and Elizabeth Callison for their assistance and comments.

<sup>2</sup> U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, issued April 2, 1992, revised, April 8, 1997. Available at <http://www.ftc.gov/bc/docs/horizmer.htm>.

the overall assessment of the likely impact of the merger on competition,<sup>3</sup> since the ultimate decision as to whether or not to challenge a merger necessarily involves a compounding of the probabilities that the conclusions of each of steps 1-5 is correct.

A great deal of evidence of a number of kinds is collected and assessed in a merger investigation. The parties to the proposed merger typically provide a voluminous amount of their business documents.<sup>4</sup> Other parties, *e.g.*, competitors to the merging parties and customers, may also supply some of their business documents. The parties to the merger, and sometimes other parties, provide data of various kinds (including financial data, and transactions data).<sup>5</sup> Many industry participants (such as the parties to the merger, competitors, customers, distributors, and third party “experts”) are interviewed, often extensively. Some interviews are conducted via deposition, under oath. A merger investigation involves extensive analyses of all this information, generally over a period of a number of months.

The first step in merger analysis is the delineation of the relevant product market (“product market definition”). The analysis of market definition outlined in the *Guidelines* is to find the smallest set of products, including the products of the parties to the proposed merger, that a monopolist would need to control to profitably increase prices a small but significant amount above competitive levels.<sup>6</sup> It is important to note, however, that concluding that a hypothetical monopolist would find it profitable to raise prices post-merger does not imply that the merger is anticompetitive. More analysis is needed to determine whether the merged firm (unless it is a 2-to-1 merger, protected from entry and without substantial efficiencies) could raise prices unilaterally or whether the merger would facilitate coordination among the remaining firms.

Although the *Guidelines*’ analysis for market definition seemingly poses a simple question amenable to economic analysis (*e.g.*, estimate demand and costs facing the hypothetical monopolist and estimate the hypothetical monopoly price), the evidence available in an investigation, although extensive, generally does not have data suitable for precise econometric estimation. In many cases, determining the precise contours of the market is complicated. Often, there are not black and white lines delineating what is in the relevant market and what is excluded from the market. In such circumstances, conducting “sensitivity tests” by analyzing the competitive effects of the transaction under alternative plausible market definitions allows us to determine the extent to which the end result of the analysis is dependent on the exact contours of the market defined. At minimum the presence of these other competitors must be accounted for in conducting the analyses of potential competitive effects of a merger.

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<sup>3</sup> In addition, the different steps are usually analyzed concurrently. That is, if there are plausible markets where competitive effects might occur, the analysis of potential competitive effects in those markets will be analyzed at the same time as analysis of whether those markets are sustainable occurs.

<sup>4</sup> Typically, at least dozens, if not hundreds of boxes of documents, the boxes being the size of the typical copier paper box containing several reams of copier paper.

<sup>5</sup> The transactions data supplied in the cruises investigation involved over 100 gigabytes of data.

<sup>6</sup> This price increase is generally referred to as a “SSNIP” (small but significant non-transitory increase in price). A similar analysis is done to determine the relevant geographic market definition.

Whether a hypothetical monopolist would likely be able profitably to raise prices by a SSNIP depends on the reactions of customers to such a price increase (i.e. the volume that would be lost due to customers either switching to other products or simply purchasing less), the size of the price increase, and the profit margin of the hypothetical monopolist. The analysis compares the increased profits from the price increase on customers who remain with the lost profits from customers who switch to other products or purchase less volume. A SSNIP would be profitable for a hypothetical monopolist if the former is greater than the latter. The typical approach to implement the *Guidelines*' analysis is to conduct "Critical Loss" analysis.<sup>7</sup> Briefly, this is a three-step analysis. First, we assess likely customer reactions to a SSNIP and in particular, to obtain an estimate of the likely *actual loss* from a SSNIP. Second, we assess how much sales would the hypothetical monopolist have to lose such that there would be no increased profits from the price increase. This value is often referred to as the "Critical Loss." The critical loss value will depend on the variable profit margins of the hypothetical monopolist.<sup>8</sup> Finally, we compare the estimate of likely actual loss with the critical loss estimate to determine whether a price increase would be profitable. Because the critical loss and actual loss generally cannot be estimated with exact precision, so we also conduct sensitivity analyses on the estimates. If a SSNIP is not likely to be profitable then the product market is to be expanded by including the next closest substitutes and the analysis repeated until the smallest group of products such that a hypothetical monopolist would like be able to increase price profitably is identified.

To implement the hypothetical monopolist test, a number of different types of analyses may be conducted. In any particular case, the actual analyses conducted depends both on the specific details of the matter and on the data that is available. Estimates of critical loss are obtained from the margins contained in the company's financial data and the size of the price increase being tested.<sup>9</sup> To estimate actual loss from a price increase, the Commission begins with qualitative evidence that comes from interviews with customers. Customers provide information on what alternatives they have to the products or services sold by the merging parties and the importance of price and other factors to their decision. Commission staff also examine company documents for information about what competitors the parties and others focus on, and possibilities for substitution. Where possible, we use historical data to attempt to estimate in various ways (depending on the limitations of the data) the likely response in sales to a hypothetical post-merger price increase. Sometimes we are able to estimate demand, and therefore demand elasticity reasonably reliably from historical data. However, given the type of data typically available (data from the parties to the proposed merger that is often quite messy and only covers a few years, and fragmentary data for the rest of the industry), demand

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<sup>7</sup> For further discussion of critical loss *see* Barry C. Harris and Joseph J. Simons, "Focusing Market Definition: How Much Substitution is Necessary?" *Research in Law and Economics*, v. 12, 1989, p.207-226.

<sup>8</sup> These can also be expressed in terms of actual elasticity and "critical elasticity."

<sup>9</sup> See Simons and Harris (1989) for formulas for calculating the Critical Loss. For criticism of critical loss analysis (particularly related to inferring small markets from large margins) *see* Michael Katz and Carl Shapiro, "Critical Loss: Let's Tell the Whole Story", *Antitrust*, 2003, John R. Woodbury and William Page, "Paper Trail: Working Papers and Recent Scholarship," *The Antitrust Source*, May 2003, and Daniel P. O'Brien and Abraham L. Wickelgren, "A Critical Analysis of Critical Loss Analysis," *Antitrust Law Journal* (Forthcoming).

estimation frequently is not possible. Thus the typical quantitative analyses employed include a wide range of methodologies from cross-tabs to simple regressions that provide us information about the likely magnitude of own- and cross-price elasticities.

A particularly useful type of analysis, where possible, is analyses of “natural experiments.” Natural experiments are events that provide relatively stark changes in relative prices or changes in the number of competitors over time or over space. For example, although we might not have data suitable for estimating demand, we might obtain useful evidence bearing on whether widgets and gadgets are in the same market if during the period of data there have been substantial relative changes in the prices of the two products. Another way to conceptualize the hypothetical monopolist analysis is to try to determine whether competition between a particular set of products or producers significantly impacts the price of those products. Thus a potential “natural experiment” to analyze this issue might exist if during the time period for which we have data there is a new supplier of widgets. If a careful analysis of data and available evidence shows that prices for widgets fell significantly and that this appeared to be not a transitory phenomenon,<sup>10</sup> such an analysis would indicate that gadgets are not “the” constraint on widget prices. This result would be consistent with widgets being a relevant market. Yet another example involves situations where there are a varying number of competitors over geographic markets for the same product, and a careful analysis of prices across the markets may be able to show whether or not the number of competitors has a significant impact on price.

After the market is defined, the next step is to determine if there could be anticompetitive effects after the merger. As a first step, we measure market shares and concentration in the relevant market. This provides a screening device to assess whether further analysis is required. If the level and change in concentration is “low,” the merger is unlikely to result in competitive effects.<sup>11</sup> It is well accepted in economics (and antitrust enforcement) that an increase in concentration in a relatively concentrated market does not “prove” that a merger would be likely to be anticompetitive. Rather, a conclusion that a merger is likely to be anticompetitive requires a theory of anticompetitive effects of the merger that is thoroughly based in all the relevant facts and institutions of the industry setting.

There are two principal types of anticompetitive theories that are typically considered in a merger analysis: unilateral effects and coordinated interaction. In unilateral theories, the merged entity has the ability to profitably and unilaterally increase its prices, which requires that it does not lose enough sales to make the price increase unprofitable. Among the theories that may be applicable for assessment of potential unilateral anticompetitive effects arising from a merger are differentiated Bertrand oligopoly, or auction models with a merger of the two lowest cost bidders. In coordinated interaction theories, the merger results in an increased likelihood that the remaining firms can coordinate their actions to reduce competition or in a decreased likelihood that any existing coordination would break down. This reduction in competition may come from the firms now being able to explicitly collude, but more likely would come from the merger

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<sup>10</sup> Being “careful” in this context requires the analyst to determine whether there are other factors that may have been important factors in driving widget prices down.

<sup>11</sup> The *Guidelines* specify thresholds for HHIs, but for more than a decade the actual enforcement thresholds have generally been significantly higher.

changing the incentive and ability of the competitors to engage in tacit coordination. As part of this analysis, we take into account the potential for efficiencies and their impact on the likelihood of competitive harm.

Beyond unilateral effects and coordinated interaction theories, sometimes the evidence developed in a merger investigation is conclusive on the determination of the likely effects of the merger, even when there may not appear to be an obvious specific unilateral or coordinated effects theory. For example, in industrial products mergers with a relatively small number of sophisticated, knowledgeable customers, if representative customer opinions, derived from extensive interviews, indicate that the likely effect of the merger will be to raise price, that evidence is often conclusive for the federal antitrust agencies. There may also be quantitative evidence, arising from “natural experiments,” would demonstrate convincingly that the number for competitors significantly impacts transactions prices (controlling for potentially confounding factors), or that when the parties to the merger compete head-to-head, prices are significantly lower (controlling for potentially confounding factors).<sup>12</sup>

Competitive effects analysis requires careful, insightful economic theory applied to data and a great deal of qualitative evidence. With respect to unilateral effects theories, we are looking for information about the importance of one of the parties to the merger as a constraint on prices of the other party to the merger – either unilaterally or its role as a constraint in the industry. In so doing, we are looking at what the qualitative evidence (*e.g.*, company documents and customer opinions) and data indicate about the current nature and state of competition in the industry. Is there evidence that the competitive interaction between the merging firms is particularly important?

When the competitive effects theory is coordinated interaction, we examine whether market conditions are conducive to coordination. Dynamic oligopoly theory has established the conditions necessary for effective coordination of competitors (“consensus, detection, and punishment.”)<sup>13</sup> Consensus requires sufficient commonality in the incentives and abilities of the coordination group (important factors include the costs and perceived benefits of price increases across members of the coordination group) to reach consensus to coordinate, what to coordinate “about” and by “how much” (*e.g.*, to raise prices to what level). Coordination also requires sufficient transparency and simplicity in the market, in the nature of transactions, and in relevant market outcomes, that reaching a consensus, detecting cheating, and effectively deterring cheating by credible punishment are feasible.

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<sup>12</sup> As discussed in Section VI.A, we conducted such analyses in the cruises investigation but found no empirical support for the number of competitors significantly impacting the level or distribution of prices.

<sup>13</sup> See, for example, Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach*, Chapter 10. For an interesting example of the consensus, detection, punishment paradigm being applied in litigating a merger challenge, see the European Union’s Competition Commission’s challenge of the AirTours/First Choice merger (*see* the Commission decision [http://europa.eu.int/comm/competition/mergers/cases/decisions/m1524\\_en.pdf](http://europa.eu.int/comm/competition/mergers/cases/decisions/m1524_en.pdf), and the court’s decision that overturned the Commission decision [http://europa.eu.int/smartapi/cgi/sga\\_doc?smartapi!celexplus!prod!CELEXnumdoc&lg=en&numdoc=61999A0342](http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexplus!prod!CELEXnumdoc&lg=en&numdoc=61999A0342)).

To begin, we caution that for a coordination theory to be valid, it is necessary that the particular proposed merger leads to a significant change in *market* competition. Careful quantitative analyses of various kinds, using data on prices, outputs, other competitively important instruments (*e.g.*, sometimes new product introduction or advertising and promotion) can shed significant light on the likelihood that the merger will result in the stimulation or strengthening of coordinated behavior. We provide a number of examples below in our discussion of our analyses in the cruise mergers. Here, we briefly summarize some of the types of empirical analyses relevant to an assessment of the potential for coordinated interaction effects arising from a merger.<sup>14</sup> We examine the complexity of pricing by looking at the number of different prices as well as the distribution of prices across firms, time, and other categories of interest. We look for systematic relationships in pricing (or capacity) that would aid in reaching and monitoring coordination. For example, are the data consistent with some level of coordination? One indication may be systematic patterns in prices or changes in capacity over time.<sup>15</sup> We look to see whether one of the parties to the proposed merger firm has behaved particularly aggressively in a manner that has had a significant impact on the state of competition in the market, and whether the merger would be likely to remove this “maverick” competitor. We look at factors that could upset any agreement that was reached – for example variability in demand may make monitoring an agreement and punishing deviation difficult. We look at the financial incentives of the firms in the industry and their different positions. We look for any “natural experiments,” for example new product introductions or entry, that may provide evidence of past reactions to events. There are many quantitative analyses, of which the ones described above are but a few, that can shed light on the likelihood that the merger will enhance coordination of the remaining firms. The discussion of the cruise ship investigation that follows will highlight the variety of analyses that were used to understand the industry and assess the potential for coordinated effects.

If the analysis determines that anticompetitive effects are likely, the next step is to consider whether an increase in prices would encourage other firms to enter into the market. If entry is likely to occur, we need to determine whether it would be sufficient to counteract the potential anticompetitive effects of the merger. Finally, if the parties to the proposed transaction claim that they will achieve significant efficiencies through the transaction, we thoroughly investigate those claims and assess how the efficiencies, if achieved, may impact the assessment of the potential competitive effects of the transaction. For example, a merger that achieves substantial efficiencies may reduce the likelihood that there will be coordinated interaction effects of the merger, since such efficiencies may destabilize the ability to coordinate in the industry.

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<sup>14</sup> For a more detailed discussion, see David Scheffman and Mary Coleman, “Quantitative Analyses of Potential Competitive Effects from A Merger,” 2003, forthcoming *George Mason University Law Review* (<http://www.ftc.gov/be/quantmergeranalysis.pdf>). For a summary of recent thinking on the analysis of potential coordinated interaction effects of a merger by Department of Justice, Antitrust Division economists, see Andrew R. Dick, “Coordinated Interaction: Pre-Merger Constraints and Post-Merger Effects,” <http://www.crai.com/Agenda/Dick.pdf>.

<sup>15</sup> This sort of analysis must be used with care, because very competitive markets often have systematic patterns of prices or changes in capacity across competitors and time. Below, our analyses of cruise transactions data will further clarify how analysis of the presence or absence of systematic patterns in data can shed light on the viability of a coordinated interaction theory.

### III. Overview of the Cruise Ships Investigation

On November 20, 2001, Royal Caribbean Cruises and P&O Princess Cruises announced a friendly merger. Less than a month later, on December 16, 2001, Carnival Cruises made a hostile bid for P&O Princess Cruises. At the time that the proposed mergers were announced, Carnival (which sailed under the Carnival, Holland America, Cunard, Seaborn and Windstar brands) was the largest cruise ship company in the world. Royal Caribbean, which sailed under the Royal Caribbean and the Celebrity brands, was the second largest cruise ship company in the world. P&O Princess (which sailed under the Princess, P&O Cruises, AIDA, A'ROSA, and Swan Hellenic brands) was the third largest cruise ship company in the world. The other major cruise ship company was Star Cruises, which sailed under the Norwegian, Star and Orient brands. The Federal Trade Commission investigated both proposed mergers to determine whether either deal would likely be anticompetitive, through higher prices, decreased capacity, or other potential anticompetitive effects.

This paper can only briefly summarize some of the economic analyses conducted by FTC economists in connection with this investigation. Confidentiality limitations prevent disclosure of any specific information. Further, space limitations preclude doing full justice to FTC economist analyses; the memoranda describing these analyses approached 200 pages. We also cannot do full justice to the innumerable empirical analyses that were conducted. We had over 100 gigabytes of transactions price data.<sup>16</sup> We also had data on capacity over time and some public source data. Finally, we had extensive financial data from the parties to the merger. When we present below some of the *examples* of empirical analyses, these represent just a few of literally hundreds of analyses of various kinds – including regression analyses, various kinds of cross-tabs, summary statistics, and extensive financial analyses of various kinds that were conducted in evaluating these mergers. As is always the case, besides conducting empirical analyses FTC economists reviewed and analyzed all the relevant qualitative evidence developed in the investigation. In this paper we focus to a significant extent on the analyses relevant to an assessment of potential anticompetitive coordinated effects arising from the mergers. This is for reason of space and because the issues here are relatively novel from the perspective of published economic literature.

To get the “punch line” up front, the FTC chose not to challenge the proposed mergers. On October 5, 2002, the Commission voted 3 to 2 to close the investigation, determining that the merger was unlikely to result in competitive harm. In this matter (as with a number of other matters investigated by the Muris Commission) the FTC has been quite transparent in explaining

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<sup>16</sup> As part of the investigation, the parties submitted hundreds of gigabytes of data on passengers that took a cruise between January 1, 1999 and December 31, 2001. The data included basic information on the cruise (line, ship, itinerary), the gross price paid by the passengers, the net price received by the cruise line (gross price less commissions and the cost of non-cruise add-ons such as airfare or land packages), the date of purchase, the class of cabin booked, and the class of cabin the passenger sailed in (basically whether the passenger received an upgrade). We did not have data on all bookings (most bookings are cancelled before sailing). What we had were data on bookings where the passenger actually paid and sailed. That the majority of bookings are cancelled impacts the competitive analysis.

its decisions. There was an extensive statement by the majority Commissioners<sup>17</sup>, dissenting statements by the minority Commissioners,<sup>18</sup> a speech by the head of the Bureau of Competition (the legal bureau at the FTC that handles antitrust cases) explaining his decision to recommend not challenging the mergers,<sup>19</sup> and a presentation to the American Bar Association Mergers Acquisition Committee of the Antitrust Section by the FTC head economist explaining some of the relevant economic analysis.<sup>20</sup> The decision not to challenge the mergers has been criticized in an editorial by two economists.<sup>21</sup> We did not write this paper to argue the merits of this FTC decision. Rather, the purpose is to highlight the important role of empirical economic analyses in antitrust. Empirical economic research could contribute more to developing new analyses and refining existing analysis. This is a worthy area for industrial organization economists to pursue, both as an academic contribution and as a contribution to improving merger and other antitrust investigations.

In the investigation, there were three key issues. First, what was the relevant market? In particular, are vacations on cruise ships part of a broader vacation market? If so, the share of the combined firm would be low and competitive effects would be unlikely without further analysis.<sup>22</sup> Conversely, if the market were limited to ocean cruising, the combined firm would have a substantial share of a concentrated market and thus further analysis of potential competitive effects would be required. Second, if cruises are a market, what were the relevant theories of potential anticompetitive effects? As explained below, the evidence did not support a unilateral effects theory so the primary focus was whether the merger created a significantly increased potential for coordinated interaction. Would the merger allow the various cruise companies to coordinate and increase prices to (at least some) cruise ship passengers, or to coordinate on increments in capacity? Finally, we had to assess the potential for and impact of entry and/or expansion by “fringe” competitors.

The remainder of the paper is organized as follows. The next section provides some background on the cruise ship industry. Section V discusses market definition and the analyses

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<sup>17</sup> See <http://www.ftc.gov/os/caselist/0210041.htm>. Examples of other notable FTC statements explaining decisions occurred in Synopsys/Avant! (<http://www.ftc.gov/os/caselist/0210049.htm>), in Cytec/Digene ([http://www.ftc.gov/opa/2002/06/cytc\\_digene.htm](http://www.ftc.gov/opa/2002/06/cytc_digene.htm)), Phillips/Tosco (<http://www.ftc.gov/opa/2001/09/philipstosco.htm>), and Kroger/Raleys (<http://www.ftc.gov/opa/2002/11/krogerraley.htm>).

<sup>18</sup> See <http://www.ftc.gov/os/caselist/0210041.htm>.

<sup>19</sup> See Joseph J. Simons speech “Merger Enforcement at the FTC,” October 24, 2002, available at <http://www.ftc.gov/speeches/other/021024mergeenforcement.htm>.

<sup>20</sup> See David T. Scheffman’s presentation “Cruise Investigation: Empirical Economic & Financial Analyses,” November, 2002, available at <http://www.ftc.gov/speeches/other/021024mergeenforcement.htm>.

<sup>21</sup> See Warren S. Grimes and John E. Kwoka, “A Study in Merger Enforcement Transparency: The FTC’s Ocean Cruise Decision and the Presumption Governing High Concentration Mergers,” *The Antitrust Source*, May 2003.

<sup>22</sup> As we will discuss below, there were important “interactions” between market definition and analysis of potential competitive effects.



we conducted to assess the relevant market in this matter. Section VI - VIII fill discusses the potential theories of competitive harm from the merger and the analyses we conducted to assess these theories. Specifically, Section VI discusses the competitive effects analyses associated with “natural experiments” regarding the direct effects of the merger and unilateral effects. Section VII discusses the analyses conducted with respect to coordinated price effects. Coordinated capacity theories are discussed in Section VIII. Our conclusions are presented in Section IX.

#### **IV. The Cruise Ship Industry**

The modern cruise industry is a relatively new vacation option. Destination cruising, where the ship is the destination as opposed to a means of transportation, began in the 1960s,<sup>23</sup> with the conversion of ocean liners. In the 1970s, ships designed for destination cruises began to be built, eventually replacing most of the former ocean liners. Today there are over 200 ships with over 225,000 lower berths.<sup>24</sup> The industry continues to grow rapidly, with twenty-five new ships with more than 50,000 lower berths scheduled to be constructed in 2003 and 2004. As the cruise industry has grown, the ships have grown larger and more amenities have been added.<sup>25</sup> The industry has also seen entry, exit and consolidation over the years. Norwegian and Holland America began as operators of transatlantic ocean liners, but transformed themselves into cruise lines. Princess entered in 1965, Royal Caribbean in 1969, Carnival in 1972, Celebrity and Renaissance in 1989, Regal in 1993, and Disney in 1998. Regency exited in 1995, Premier in 2000, Renaissance in 2001 and Regal in 2003.<sup>26</sup> Previous mergers include P&O buying Princess (1974), Carnival buying Holland America (1989), Costa (1997) and Cunard (1998), Royal Caribbean buying Celebrity (1997), and Star Cruises buying Norwegian Cruise Lines (2000) which had just purchased Orient Lines (1998).

At the time of the proposed mergers, world shares of cruise ship capacity (measured by lower berth capacity) were Carnival 28%, Royal Caribbean 23%, Princess 13%, Star (which owns the Norwegian line, among others) 11%, with the remaining 25% spread among various other firms such as Disney, Crystal, and Radisson Seven Seas and several smaller firms in Europe, including Louis Cruise Lines, Royal Olympic Cruises (partially owned by Louis Cruise Lines), Festival, and MSC. As mentioned above, there are 25 additional ships entering service in 2003 and 2004, with about 83% going to the four largest companies. If these companies do not sell or scrap older ships, their combined shares will increase. If all current ships continue to sail, the shares at the end of 2004 would have been Carnival 31%, Royal Caribbean 21%, Princess

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<sup>23</sup>Princess began operating cruises to Mexico in 1965. In 1966, Norwegian moved the M.S. Sunward to Miami and began sailing to the Caribbean.

<sup>24</sup>There are typically two lower berths per cabin. Some cabins will also have upper berths that were not included in the capacity of the ships for these market share calculations. Capacities are based on various public sources such as company websites and travel guides.

<sup>25</sup> Amenities may include such features as skating rinks, climbing walls and personalized dining. A modern state of the art cruise ship is in many ways analogous to a floating Las Vegas hotel.

<sup>26</sup>With the exception of Renaissance, which shutdown on September 11, 2001, most cruise lines that exited were continuing to operate converted ocean liners as opposed to ships designed for destination cruise vacations.

15%, Star 10%, and the other cruise lines a combined 23%. Since the merger investigation ended, Star has announced the purchase of two former mothballed ocean liners, which it plans to refurbish for its Norwegian Cruise Lines subsidiary.<sup>27</sup>

Different cruise lines focus on passengers from different geographic areas, and we will refer to cruise lines based on the where the majority of passengers live as opposed to where the ships sail. However, North Americans often sail on European lines, and Europeans often sail on North American lines. In addition, ships from North American lines will sail in Europe during part of the year, and ships from European lines will sail in North America for part of the year. The market shares for North American firms (based only on the lower berth capacity of their North American lines), are Carnival (Carnival and Holland America lines) 35%, Royal Caribbean (Royal Caribbean and Celebrity lines) 34%, P&O Princess (Princess line) 12%, Star (Norwegian and Orient lines) 12%, and other lines including Disney, NYK's Crystal line, Radisson, and Silversea, 7%. These cruise lines made up two thirds of worldwide capacity.

The types of cruises offered vary in many ways. Key distinguishing factors include: destination (often referred to as "trade"), length and departure date. The most popular trade is the Caribbean, followed by Alaska and Europe. Most cruises last seven days, but there are a significant number of three, four, five and ten day cruises as well. Some trades (*e.g.*, the Caribbean and Mexico) have departures throughout the year, while others (*e.g.*, Alaska and Europe) only have sailings during certain times of the year.

Cruises also vary based on the characteristics of the ship and the cruise line. The largest ships have over 1500 cabins, with smaller ships having as few as 100 cabins. Ships also vary in their mix of different cabin types. Cabins fall into four basic categories: inside, ocean view, balcony, and suites. Many older ships have no cabins with balconies, while some of the new ships have over 70% balcony cabins. Each type of cabin is broken down further based on which deck it is on, or whether it is fore or aft. For example, similar cabins on higher decks are considered better. Different cruise brands also vary to some extent as to the types of consumers that they cater to, which influences the types of amenities that the cruise lines offer. For example, Carnival and Royal Caribbean to some extent focus their marketing to younger active passengers, while Holland America and Silversea to some extent market themselves to more mature passengers looking for more luxurious accommodations.

Roughly 40% of passengers on a particular cruise are taking their first cruise.<sup>28</sup> The fact that so many passengers are first time cruisers that are likely to have considered other vacation options affected the product market analysis. Also important was the fact that many passengers who take a cruise never cruise again or, if they do, do so infrequently. Thus cruise lines are constantly seeking to attract passengers who have never cruised or only cruise infrequently.

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<sup>27</sup> Norwegian Cruise Line press release, April 14, 2003. Available at <http://www.ncl.com/news/pr041403.htm>

<sup>28</sup> Cruise Lines International Association website. Available at <http://www.cruising.org/press/press-kits/kits/pko-57.cfm>

Buying a cruise can be a complicated purchase. Cruise lines often bundle related products with the cruise allowing them to offer package discounts. For example, the passenger can choose to add on airfare to and from the cruise, land packages before or after the cruise, and shore packages during the cruise. The prices for the cruise and some of the add-ons will change regularly during the months leading up to sailing depending on how well the cruise is selling. The complexity of purchase also impacts the competitive analysis, in that such complexity, along with the complexity of the many itineraries, types of ships, berths on ships, are likely, other things equal, to make some types of coordination difficult.

Unlike many other travel options, most cruises (over 90%) are still sold through travel agents. One explanation for the reliance on travel agents is the heterogeneous product mix of different cruises. Travel agents help ensure that cruise passengers are matched with the cruise that best fits the passengers' preferences. Another explanation is the complex nature of the purchase. That travel agents overwhelmingly account for sales is important to the competitive analysis, limiting the scope of potential theories of anticompetitive price discrimination, since the cruise lines have very limited information the characteristics of specific customers when they book.

A given ship/itinerary starts booking eighteen months or more before departure. Until late in the booking cycle, there are usually no penalties for canceling a booking. The majority of bookings are cancelled. Like most other participants in the hospitality industry, cruise lines use some type of "yield" or "revenue" management system, which has implications for market definition and the competitive effects analysis.<sup>29</sup>

## V. Market Definition

Cruises are one form of vacation. Because vacations on cruise ships have differences with land-based vacations, a cruise ship market was plausible. In many ways, however, vacations on cruise ships are analogous to other vacations and thus a broader market is also plausible. For example, for some customers, a week at an all-inclusive resort in the Caribbean may be similar to a week on a cruise ship in the Caribbean since for both vacations, most of the customers' expenses are covered by the weekly rate, and there are similar activities such as eating, swimming, sunning, and night life. For other customers, a long weekend in Las Vegas would be similar to a three or four day cruise to the Bahamas since most cruise ships have Vegas-style shows and casinos. The investigation uncovered some evidence that cruise competitors focused primarily on each other but there was also evidence that the cruise lines worried about selling in a broader vacation market and capturing a larger share of that market by offering a competitive product.

Any market broader than cruise ships would mean the mergers were not problematic because the merging parties would have very low market shares. Thus, as is often the case, market definition is a critical first step in the merger analysis. As discussed, the qualitative evidence was somewhat mixed with regard to whether cruises were a market. We employed quantitative analyses to provide further information about this issue. After all, the *Guidelines*

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<sup>29</sup> The industry frequently uses the term "revenue management" to describe their version of yield management. We will use the more common "yield management" term.

market definition analysis is fundamentally an empirical economic analysis involving demand elasticities and costs. As described above, the market definition analysis asks whether a hypothetical monopolist controlling all cruise ships could profitably raise prices a small but significant, non-transitory amount, to at least some identifiable set of consumers.<sup>30</sup> This analysis requires assessing the likely actual loss from a small but significant (say 5%), non-transitory price increase and whether this exceeds the Critical Loss.

As discussed above, the Critical Loss value is determined by the variable margins in the industry (assuming that variable margins are approximately constant in the relevant range). High margin industries have a smaller critical loss than low margin industries because each lost sale represents more lost profits. Once the decision has been made for a cruise ship to sail, the margins in the cruise ship industry are very high since most of the costs at that point are fixed. Furthermore, since the cruise ship makes money on complementary goods and services once the person is on board, the margins are effectively even lower (some would even argue that the margins are negative).<sup>31</sup> Therefore, only a relatively small number of consumers would need to be lost for a price increase to be unprofitable. This does not mean by itself that the market is broader than cruise ships – rather one still must analyze what the actual loss is likely to be.

This is a very complex industry with many prices. Prices vary across time and across types of accommodations, itinerary, type of ship, and other factors. Quantities are also complex in that there are different types of berths, ships and itineraries. Thus, estimating demand elasticities would, at best, be highly problematic. We also had only a few years of data. However, we had the advantage that during the period of the data there was a very large increase of capacity in a short time. We used this natural experiment to develop some crude estimates of demand elasticity. A notable aspect of this natural experiment is that the industry “absorbed” this large short run increase in capacity with little impact on capacity utilization. Thus, the cruise lines were able to fill up the berths even with a large short run increase in capacity. Of course they accomplished this, in part, through use of yield management. But the result was still striking. That the cruise industry could absorb this capacity so readily suggests that cruises are competing with other vacation options and thus is consistent with cruise vacations being in a broader vacation market.

Because of the confidentiality of the data, we cannot report specific results. We estimated arc elasticities of demand (response of average revenue to the large short run change in quantity) in several different ways, controlling in various ways for the potential impact of such as factors as ship effects, berth effects, month effects, millennium cruises, and post-September 11 cruises. The estimates of arc elasticity of demand based on this natural experiment were around -2 or larger (in absolute value).<sup>32</sup> With this elasticity of demand, in order for a hypothetical monopolist to profitably increase prices, its margins would have to be below 50% – much lower

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<sup>30</sup> This is a “Critical Loss” analysis, discussed further below.

<sup>31</sup> Our data on margins was based on accounting data, which is not the same as economic margins.

<sup>32</sup> Note that these should probably be interpreted as *short run* elasticities, since it is plausible that the industry could accommodate a large increase in capacity with less downward pressure on price over a longer period of time (even with the level of demand constant). Thus the longer run elasticity of demand might be considerably greater than 2.0.

than short-run cruise ship margins.<sup>33</sup> Thus, our analyses showed that an across-the-board price increase would not be profitable.<sup>34</sup> This means that cruise vacations would not be a market for what is the typical market definition test, *i.e.*, an across-the-board price increase. This result should not be surprising. It is quite plausible that there is some non-trivial proportion of consumers who purchase cruises that seriously consider other vacation options. The Critical Loss analysis shows that proportion does not have to be very large for an across-the-board price increase to be unprofitable. Further, the fact that the industry was able to absorb a large increase in capacity in a short time with no significant effect on capacity utilization indicates the demand is elastic. Finally, a high proportion of people who purchase cruises are first time “cruisers,” and repurchase frequencies by repeat “cruisers” are low, suggesting many cruisers are likely to consider other vacations as alternatives.

Although an across-the-board price increase would not support a cruise market, product market analysis also considers whether a hypothetical monopolist could identify less price-sensitive customers and use price discrimination to increase prices to a subset of consumers in the market.<sup>35</sup> The cruise lines use yield management, and the data showed that different cruise ship passengers in similar cabins often pay very different prices. Of course, the fact that different consumers pay different prices does not in itself indicate that there is a “competitive problem” that is exacerbated by a merger. For example, most hotels currently use some form of yield management, but that, in itself does not mean that there are competitive problems in the hotel industry. Rather, yield management is one way competitive markets price perishable goods and services.<sup>36</sup>

Thus the typical approach to market definition was modified to have a hypothetical monopolist using yield management. Interestingly, there is very little published literature related

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<sup>33</sup> Critics of the critical loss analysis in this merger have questioned how high margins and relative market elasticity of demand could exist at the same time, since the Lerner Index should link high margins with relatively low firm elasticity of demand, and the market elasticity of demand would need to have an even lower elasticity of demand. If firms maximize profits, high margins and high elasticity should not be able to occur simultaneously. However, this relationship need not hold if there are capacity constraints, which is the case in the cruise industry. When making the decision on whether to build new ships or not, firms will consider the impact adding an additional ship will have on the profitability of its fleet. It is likely that the outcome of these decisions will lead to binding capacity constraints in the short run. This type of behavior would be similar to the model in David M. Kreps and José A. Scheinkman, “Quantity Precommitment and Bertrand Competition Yield Cournot Outcomes,” *The Bell Journal of Economics*, Volume 14, Issue 2 (Autumn, 1983), 326-337. See Warren S. Grimes and John E. Kwoka, “A Study in Merger Enforcement Transparency: The FTC’s Ocean Cruise Decision and the Presumption Governing High Concentration Mergers,” *The Antitrust Source*, May 2003 for criticism of critical loss as applied to the cruise ship investigation. Grimes and Kwoka did not have available the details of the analysis supplied in this paper (or various confidential facts that cannot be disclosed).

<sup>34</sup> This is consistent with the cruise lines behavior – *i.e.*, they do their best to fill up, and generally, on average, fill up to practicable capacity. For example, the large short term increase in capacity had very little short run effect on capacity utilization and no effect after the first season.

<sup>35</sup> Such “price discrimination” markets are also discussed in the *Guidelines* at § 1.12.

<sup>36</sup> For examples, participants in “farmers markets” generally use pricing strategies and tactics analogous to yield management.

to this issue. However, we did find research that demonstrated that a monopolist using yield management would likely generate higher total revenue than would be generated by all competitors in a market with more than one competitor. But this intuitively obvious result does not “prove” that a cruise merger would be anticompetitive. Cruise lines within practical limits approximately sell out. They have strong incentives to do so, because of the very high variable margins (due to low marginal costs). A monopolist has similar incentives. In fact, it is likely that the hypothetical monopolist would practicably sell out also. Thus the effects of the hypothetical monopolist would not likely be on “output” (for fixed capacity), but rather for the pricing of fixed capacity. This produces somewhat complex (for antitrust analysis) issues as to what outcomes would be anticompetitive. For example, a plausible result would be that the hypothetical monopolist charges higher prices to some consumers and lower prices to other consumers. Is this anticompetitive? Under a total welfare standard, there would be no effect because there would be no deadweight loss. For a consumer welfare standard, which is generally the standard employed in antitrust analysis, on average consumer welfare would decline since average prices would increase. However, even here the effects are complex since some consumers would have a welfare increase while others would have a welfare decrease. In addition, pricing in this fashion might attract more potential passengers to the industry generally, and thus allow the industry to sustain greater capacity in the long run.

Despite these knotty theoretical issues, our analysis of market definition focused on determining whether we could identify a segment of customers and/or transactions that could be a viable price discrimination market. To begin, since cruises are overwhelmingly sold by travel agents, a theory involving the characteristics of the customers was not viable. Instead, we focused on the characteristics of the transactions – such as type of berth or time of booking. We were looking for was something analogous to “business travelers” in the airline industry.<sup>37</sup> (Again, cruise lines are unlike airlines in that they generally run at practical capacity, so in this critical dimension, and some others, cruise lines differ from airlines).

There were several different segments of transactions that were considered as potential target segments for a price increase by a hypothetical cruise ships monopolist. Candidates for potentially less price elastic transactions included: customers that booked their cruise early,<sup>38</sup> consumers that purchased one type of cabin (such as the higher-priced balcony cabins).<sup>39</sup> Such candidates are discussed in the context of our empirical analyses in Section VII.C. Our analyses were not able to identify a viable price discrimination segment. Briefly, this is because there is very substantial variation in prices that cannot be explained by any characteristics of customers, transactions, ships, or trade. That is, the practice of yield management in the cruise line industry does not generate prices that can be adequately explained by customer or transaction

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<sup>37</sup> It is of interest to note the Department of Justice airline merger cases have generally focused on business, rather than leisure travelers, in part for reasons analogous to those that arise in the antitrust analysis of the cruise line industry.

<sup>38</sup> A difficulty for this theory is that most early bookings are cancelled, and there is generally not a penalty for cancellation until close to sailing.

<sup>39</sup> Of course, it is not obvious, *a priori*, whether we should expect that the proportion of consumers who would shift to other types of vacations would differ by price, income class, or other demographics factors.

characteristics, which would be a necessary (but not sufficient) condition for a viable price discrimination market.

As we will explain below, identifying a viable price discrimination segment would not, itself, provide a viable theory of anticompetitive effects of either proposed merger, since we did not have a merger to monopoly, and the facts rejected a dominant firm theory. Nonetheless, because a hypothetical monopolist using yield management could increase its profits over competition, we concluded, following a modification of the *Guidelines*' market definition analysis, that cruise lines were a relevant product market. Put differently for those not conversant with the *Guidelines* analysis, we concluded that a merger to monopoly would be problematic, but neither proposed merger would be likely to alter pricing (or capacity) anticompetitively. That said, our empirical analyses demonstrated that how pricing under the hypothetical monopolist would differ from the *status quo* was unclear.

## **VI. Analyses of Potential Competitive Effects of the Proposed Mergers**

### ***A. Empirical Analyses of "Natural Experiments"***

To begin, as part of our empirical analyses we used various "natural experiments" to assess whether there appeared to be any significant relationship between the number of competitors or concentration and the level or distribution of prices, or between the presence of particular competitors and the level and distribution of prices. We conducted various analyses. First, industry concentration had increased over time (due to unequal capacity increases across customers and to some past mergers). The available data indicated that average prices had fallen during this period. This of course is quite crude, but it does not indicate that there was a negative correlation between concentration and average prices.<sup>40</sup> A more formal analysis attempted to test whether there was a relationship between the concentration in various trades and the prices that passengers paid. These studies looked at differences in concentration both across trades and over time, and did not indicate any relationship between concentration and price. A positive relationship between concentration and prices could indicate that trades are in fact markets, and that the higher concentrations were an indication that coordination was easier with fewer competitors. The studies did not find any such relationship. There are two possible explanations of the lack of results in these studies.<sup>41</sup> First, trades are part of a broader cruise or vacation market, so looking at concentration for the trade is misleading.<sup>42</sup> Second, trades could be a market as defined by consumer preferences, but since ships can change trades, any price differences might disappear as ships reposition. Nonetheless, it is unusual for ships be repositioned once they are announced for a season, so the fact that we were not able to find even

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<sup>40</sup> One issue with simply relying on this crude analysis is that capacity was increasing at the same time.

<sup>41</sup> These explanations assume that the data available was sufficient to be able to test for differences across trades and over time. In fact, the data we had to test this hypothesis was limited and thus the tests used were somewhat crude. However, we did not find evidence supporting that the number of competitors mattered. This finding was supported by other qualitative and quantitative evidence.

<sup>42</sup> Other empirical data supported that individual trades were not product markets. For example, in some trades both capacity and prices were decreasing at the same time. If these trades were a product market, reductions in capacity would be expected to increase prices for cruises in that trade.

short run relationship between concentration and prices is of some significance. Finally, we conducted some intensive investigations of particular trades and found no relationship within those trades between concentration and price. Of course these analyses did not prove that the proposed mergers were competitively benign.

### ***B. Unilateral Effects***

There are two main categories of unilateral effects theories considered in merger investigations, those based on various versions of homogeneous Cournot models or differentiated Bertrand models.<sup>43</sup> Some version of a homogeneous Cournot model is applied, when appropriate,<sup>44</sup> to industries where the products are relatively undifferentiated but where capacities or “output” are important. In such industries if the merged entity controls enough capacity or output, it may find it profitable to reduce output and increase prices. Generally, this will require the remaining competitors to be capacity constrained, unless the competitors are large enough to act as Cournot rather than Bertrand competitors with respect to price.<sup>45</sup> In applying such a model, one must show why the merger would allow the combined firm to raise prices. This might occur either because the increase in capacity owned by the firm makes it profitable to raise prices or the merger removes an important pre-merger constraint on one of the merging parties. The other unilateral theory (some version of a differentiated Bertrand model) is applied, where appropriate,<sup>46</sup> in industries with differentiated products, where the merged entity will now control two products that are sufficiently close competitors that they have the ability and incentive to raise prices, given Nash behavior by the competitors.<sup>47</sup> We considered both types of models in the investigation.

Both proposed mergers would lead to a firm owning between one third and one half of cruise ship capacity (depending on the geographic market), so we considered whether unilateral price increases were likely based on a dominant firm or Cournot model. That is, would the merged firm restrict output to increase price. We considered this theory both in the short run with fixed capacities and in the long run with the ability to adjust capacity.

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<sup>43</sup> See, *Guidelines* at § 2.2. See also Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization*, § 6 (2000); and Jeffrey Church & Roger Ware, *Industrial Organization: A Strategic Approach*, § 8.3 (2000) for a discussion of these models.

<sup>44</sup> The facts developed in the investigation should support that competition is adequately “explained” by such a model.

<sup>45</sup> The relevant model may also be more appropriately characterized as a dominant firm model if the competitors to the merged firm are price takers. See Jeffrey Church & Roger Ware, *Industrial Organization: A Strategic Approach*, § 4.2 (2000).

<sup>46</sup> Again, the facts developed in the investigation should support that competition is adequately “explained” by such a model.

<sup>47</sup> In this case, when the company increases the price of one firm’s product, a significant portion of the lost sales go to the other firm’s product. Since the merged entity now internalizes these lost sales, it would find it profitable to increase prices on at least one of the products. To be profitable in the long run, there need to be impediments or disincentives for the remaining competitors to reposition their products to take advantage of the reduced competition in a manner that makes the price increase unprofitable.



In the short run, the output restriction would require a reduction in passengers (for at least some subset of customers). However, since a hypothetical monopolist would not find it profitable to increase prices across the board, a dominant firm would also not be able to profitably increase prices across the board on its ships and reduce capacity utilization. Therefore, the theory would need to be that the merged entity could profitably increase prices unilaterally, via yield management, to a subset of customers (and maintaining utilization by increasing sales to other subsets of customers, e.g., the more elastic customers).

For a number of reasons (some of which we cannot disclose because of confidentiality), we rejected this theory. First, as we will see below when we discuss some of our empirical analyses, head-to-head competition on price is actually not a very important determinant of prices. This is, in part, because cruises are largely “sold” rather than “purchased.” We conducted various analyses that showed that the number of competitors on a given itinerary or given trade did not significantly impact the level or distribution of prices. Thus, it is not clear why adding a competing line would change the merged firm’s pricing incentives. Second, yield management, itself, works against a dominant firm theory. All the competitors are trying to identify and “harvest” higher yield customers. Consider an example in which the potential dominant firm “waits longer” to lower prices to try to lock in early bookers at higher prices. The competitors are trying to find these (hypothetical) higher reservation price consumers, so that if the hypothetical dominant firm waits, it is likely that competitors will “pick off” enough of the hypothetical higher reservation price consumers to make waiting unprofitable.<sup>48</sup>

The second unilateral theory was that the relatively high post-merger market shares could also give the merged entity the unilateral incentive to reduce capacity. This capacity reduction could come from building fewer ships, or if focusing on cruises marketed to North Americans, by transferring ships to lines marketed to Europeans or Asians.<sup>49</sup> Consider first the ship-transfer theory. For example, the merged entity could transfer some of its Princess ships to its A’Rosa line that is marketed to Germans. We rejected this capacity-shifting theory based on detailed financial analyses of confidential information that analyzed the financial incentives of both the merged entity and of the competitors to shift capacity. These are discussed in Section VIII. The basic intuition for the results is as follows. First, the North American cruise lines, with two thirds of the world’s capacity, are much larger than all the foreign cruise lines combined. Therefore, transferring enough ships out of North American lines to increase prices in the North American market would have a much larger effect on prices in foreign markets. Moreover, this would impact a significant fraction of the merged firm’s North American capacity, as well as the merged firm’s foreign capacity (recall the relatively high price elasticity). Our financial analyses

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<sup>48</sup> Another way to see this is that, quite simplistically, yield management can be viewed as a sequential auction system. The hypothetical dominant firm would lose the early auctions if it tried to wait. There are a number of other problems with this theory. First most early bookings cancel, and there is limited ability to restrict arbitrage. Second early bookers do not necessarily pay higher prices.

<sup>49</sup> Another option would be to scrap existing ships. However, most existing ships continue to sail even when the cruise company goes bankrupt. The main ships that are being scrapped are former ocean liners that were converted for use as cruise ships. The potential merging parties own very few of these ships, such as Cunard’s (Carnival’s) Queen Elizabeth II or Norwegian’s (Star’s) Norway, so the amount of capacity the merged entity would consider scrapping is too small to have a significant impact on industry capacity.

of confidential data showed that this would not be a profitable strategy. Furthermore, competing firms with ships in the foreign markets could reposition their ships to the North American market, making the capacity shift by the merged entity even more unprofitable.

For *future* capacity reduction theories, a very important fact was that industry participants already had commitments to future capacity that would very substantially increase industry capacity (a large number of ships are on order that will be delivered between now and the end of 2005). There was no viable theory by which the merged entity had the ability and incentive to meaningfully impact industry capacity for at least several years. We also conducted financial analyses of the profitability of adding new ships for the merged entity to assess its incentives to reduce capacity in the future. These are discussed in Section VIII. These analyses assumed that prices would fall as new ships were built (based on our estimates of price elasticity) so that one of the costs of building new ships was the lower profits on existing ships. Even after the current ships on order are delivered, the analyses showed that the merged entity would find it profitable to keep building new ships. In addition, various industry participants, large and small, continued to announce commitments to new capacity during and after the investigation.

Finally, we assessed whether the merging parties were “close” enough competitors that the merged firm would have the ability and incentive to raise prices because the merger internalizes diversion of sales between the brands. We found that this theory was not viable. To begin, the various empirical analyses found no evidence that head-to-head competition between particular competitors had, itself, a significant sustained impact on prices. With respect to characteristics of competitors’ offerings, there was substantial overlap in the competitive offerings of each of the cruise lines. Both Royal Caribbean and Carnival had ships and accommodations, and itineraries that overlapped each other and overlapped the other competitors. In addition, for some passengers, a Holland America balcony cabin may be comparable to a Crystal ship ocean view cabin, while other passengers may be willing to substitute between an interior Princess cabin and an ocean view Royal Caribbean cabin.

Moreover, it is not clear that the diverted sales would result in significantly increased revenues for the other brands. The variability of demand would also make it difficult for the merged firm to determine where lost passengers went after a potential price increase. For example, if the merged firm increased prices on successive weeks and saw sales fall 10%, one week the other line may see an increase in sales of 5%, while the other week it could see sales fall. With this type of variability, the merged company may not be able to determine whether enough lost sales would be recaptured to make the price increase profitable.

The standard differentiated Bertrand model does not fit well in this industry. Cruise lines tend to sell “full,” and capacity is fixed, at least in the short term. In addition, there is not “one” price. Thus, even if an increased price for one brand would result in significant increased demand for another brand owned by the merged firm, at best all that the firm can hope for is that average prices will increase. In the standard model, the increase in demand leads to additional sales for the merged firm’s other product, while in the cruise industry, any diverted sales would displace other (presumably lower fare) passengers so that quantity remains unchanged. Therefore, even if there are extra profits for the other brands, these extra profits are unlikely to

offset the losses from running a ship with empty cabins. As a result, the incentives to increase prices unilaterally as a result of a differentiated products theory may not exist.<sup>50</sup>

In addition, if the merging parties, hypothetically, were “close” competitors due to current choices in deployments, for example if the merging parties have an unusually high market share in a given trade, any attempt to raise prices or reduce capacity in that area could be countered by competitors repositioning extra capacity in that area or on that route. This extra capacity could be either an extra ship, or replacing a smaller ship with a larger ship.<sup>51</sup> Again, we found no evidence supporting a conclusion that the number of competitors or concentration impacted the level or distribution of prices.

## **VII. Potential Competitive Effects: Price Coordination**

In merger investigations, analysis of coordinated interaction focuses on whether market conditions after the merger would be more conducive to “collusion,” either tacit or explicit, or whether the merger might strengthen existing coordination.<sup>52</sup> As we discussed previously, market conditions that are conducive to coordination include sufficient transparency and simplicity of relevant market outcomes that make consensus and detection feasible, along with commonality in the incentives of the firms in the coordination group so that they can reach consensus. Thus, key elements of an analysis of whether a specific merger is likely to lead to anticompetitive effects through the creation or enhancement of coordinated interaction, are the specifics of the competitive process, the level of transparency and complexity, and the consistency of incentives of the competitors. In our analysis we assessed coordinated interaction theories focused on both price and on capacity. In this section, we focus on the competitive analyses related to price coordination.

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<sup>50</sup> For example, consider a merger among brands A and B, each of which currently has sales of 100 units at \$200, and 100 units at \$150, with zero marginal cost. Think of the high price as early sales, and the low price as late sales. Assume that if the high price for brand A is increased to \$220, then its early sales will fall to 80, while brand B’s early sales increase to 115 (picking up 75% of the lost sales). If brand A were on its own, this would not be profitable to follow this strategy (variable margins would fall from \$35,000 to \$32,600). After the merger, this would be profitable in the traditional differentiated product model, with the merged company’s variable margins increasing from \$70,000 to \$70,600. However, if by increasing brand B’s early sales to 115 its late sales fall to 85, the merged company would see variable margins fall from \$70,000 to \$68,350. Even if brand A picks up a portion of Brand B’s lost late sales, the merged entity often would not find it profitable to increase the early price of brand A. If brand A’s late sales increase to 110 (picking up 2/3 of the lost sales) then variable margins would fall from \$70,000 to \$69,850.

<sup>51</sup> For example, Norwegian and Royal Caribbean have both recently expanded their presence in Alaska. Norwegian has more than doubled the number of berths in Alaska since 1999, first by replacing the smaller of its two ships, the 824 passenger Norwegian Dynasty, with the 2002 passenger Norwegian Sky. Later, Norwegian added a third ship in Alaska. In the same time frame, Royal Caribbean has increased its capacity in Alaska by just over 50% by adding an additional Royal Caribbean ship and an additional Celebrity ship.

<sup>52</sup> Recall that although Cournot and Bertrand are models of oligopoly, they are not models of coordinated interaction. Further, the competitive effects of mergers in these two models arise because of a unilateral effects theory.

## A. Current State of Competition in the Cruise Industry

Cruise lines market, sell, and price to effectively sell out the ship. This goal is largely achieved, even when substantial increments of capacity are added in a short period of time. In addition, the cruise industry has been expanding rapidly for a number of years, and current capacity commitments will keep this expansion going for at least the next few years. The number of lower berths across all ships has increased to over 225,000 at the end of 2002, with over 150,000 of those berths on ships built in the last ten years. Another 50,000 lower berths are due to be added to the world's cruise lines by the end of 2004.<sup>53</sup> Prices have fallen with the rapid expansion of capacity and the introduction of larger more efficient ships. Newer ships, aside from being larger on average, also have more amenities and a higher portion of higher value cabins. For example, Carnival's Fantasy class ships, which were built between 1990 and 1998 had 45% inside cabins, 50% ocean view cabins, no balcony cabins, and 5% suites. Carnival's Spirit class ships, which were introduced in 2001, have 26% inside cabins, 9% ocean view cabins, 60% balcony cabins, and 5% suites. Thus the state of competition in the industry has been one of competition on price,<sup>54</sup> capacity, and product and service differentiation. The substantial complexity of the industry, the competition on all dimensions, the strong unilateral incentives to set prices to fill the ships, and the strong unilateral financial incentives to add capacity, combine to make the cruise ship industry an unlikely candidate for anticompetitive tacit coordination with respect to price.<sup>55</sup>

No particular competitor can be credibly put forward as a relatively important driver of the state of competition. Rather, the state of competition can be best explained as arising from by the strength of the unilateral incentives of the competitors. Each of the cruise companies has expanded capacity significantly and added new features and amenities. During a period of rapid growth fueled by increments in capacity, concentration has been increasing. There are three factors underlying the increase in concentration. First increments in capacity have changed shares over time. Second, many smaller firms have exited the industry. Finally, there have been previous mergers in the industry.

Thus, at the "30,000 foot level," this is an industry that does not provide much if any basis for effective coordinated interaction with respect to price, or that the removal of Princess, through a merger, would significantly change competition. The main part of our empirical analyses was to look intensively at transactions-level data to further understand the nature and

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<sup>53</sup> There have been older ships, mainly former ocean liners, which have been sold for scrap over the years, and will likely be more sold for scrap before 2004. Many of the older ocean liners need to be retrofitted to meet new safety regulations that are being phased in through 2010. Therefore capacity ten years ago was likely above 75,000, and overall capacity will likely increase by somewhat less than 50,000 lower berths between now and 2004.

<sup>54</sup> Price competition generally involves pricing to fill the ship. As we see below, the importance of head-to-head competition on price in this industry is relatively limited, in part because to a significant extent cruise vacations are "sold" rather than "purchased."

<sup>55</sup> Another indicator of the state of competition is that although this is a relatively new and rapidly growing industry, most competitors have made substantial efforts to reduce costs, and to varying extents across competitors those efforts have been successful.

extent of competition and to look closely at whether conditions were conducive to coordination and whether the merger was likely to change the nature of competition in the market.

## **B. Likelihood of Price Coordination: Complexity, Transparency and Incentives**

A coordinated interaction theory that involved increasing prices is complicated by the fact that a theoretical monopolist would not find it profitable to increase prices across the board. Therefore, a coordinated interaction theory involving prices would require price discrimination as well. As described in the section on market definition, a great deal of effort was made attempting to determine if there was some class of consumers that, after the merger, could be the focus of a targeted price increase. However, a theory of coordinated interaction with price discrimination adds to the complication of achieving consensus as to whom and how prices would increase, of detecting deviations, and of designing a viable and credible punishment mechanism.

As part of our investigation, we considered whether our detailed analyses of transactions-level data indicated that the cruise industry was conducive to price coordination or that there was any evidence of current coordination on price to some group of customers. The goal of these analyses was to determine the following: (1) the complexity of pricing, (2) the transparency of pricing, and (3) the commonality of the cruise lines' incentives. Several specific analyses were performed including an analysis of the relationship of prices and sales over the booking cycle of specific competing head-to-head cruises, an analysis of the extent that the pattern of prices and sales differs significantly across similar cruises, an analysis of the distribution of discounts on similar cruises, and an analysis of whether there are groups of passengers for whom pricing patterns differed in a way that suggesting less elastic demand.

### **1. Complexity**

Reaching consensus on prices in this industry would not be an easy task due to the complexity of pricing. At any point in time there are a large number of cruise prices. Individual sailings open up for sale twelve to eighteen months before the ship departs. The four major cruise companies have a combined 75 ships in their six North American brands: Carnival, Holland America, Royal Caribbean, Celebrity, Princess and Norwegian. If each ship were sailing seven-day voyages, each ship would have 50 to 75 voyages with tickets available at any given time. Conservatively, that would be 3,750 voyages.<sup>56</sup> Each ship has ten to twenty different cabin types, in four major categories – interior, ocean view, balcony and suites. Conservatively, that leads to 37,500 different products for sale at any given time. However, there is at least twice that number of prices, since the cruise lines have both individual and group prices for almost all cruises. At a minimum, there are 75,000 prices at any given time before we discuss discounting. The cruise lines often offer targeted discounts to past passengers or passengers from certain localities, and often give special deals to select travel agencies. The cruise lines also often use upgrades as a form of discounting. Many passengers buy their plane tickets through the cruise lines that purchase blocks of seats from the airlines. Since the cruise line often “charge” significantly above or below their negotiated price with the airlines (in terms

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<sup>56</sup> The average voyage length for sailings in our data is just under 7 days, with 52% of cruises 7 days, 31% less than 7 days, and 17% over 7 days.

of the implicit airline price in a bundled offering), the prices that the cruise lines charge for the airfare allows them to increase or decrease the effective prices of the cruise for passengers flying from every different airport. In effect, this could lead to almost 200 times as many prices on any given day.<sup>57</sup>

Any coordinated interaction theory would need some way to reduce the complexity of this large set of prices, both in reaching consensus on what the collusive prices should be, and in monitoring them to detect cheating. We thus looked at whether there were systematic relationships in pricing that might reduce the number of prices about which consensus regarding coordination would be necessary. One possibility was to find groups of prices that were highly correlated. For example, if there were fixed premiums for different categories of interior cabins across sailings, then the firms would only need to coordinate one price for interior cabins. While the premiums for higher quality cabin categories were fairly consistent in the brochure prices, for the sailings that we analyzed, there was considerable variation in relative transactions prices across types of berths. Another possible example would be if consecutive sailings could be combined to reduce the number of prices. However, demand for cruises is highly variable from week to week.

We also consider whether for a particular cabin category there would be a single price (perhaps the “early” price) that could be the subject of coordination. For this to be feasible, there would have to be fairly standard pattern to prices of the booking cycle. To assess whether such patterns existed, we conducted a number of analyses of the relationship between early and later transactions prices. First, we considered whether prices tended to fall through the booking cycle. While it might seem likely, *a priori*, that transactions prices fall over the booking cycle, this is not generally true. Although on average across all cruises in a given season later prices are lower than earlier prices, on any given cruise, transactions prices can fall or rise, or go up and down through the booking cycle. This is shown in Figure 1, which is just one example of the lack of a consistent pattern of prices through the booking cycle.<sup>58</sup> Thus, yield management in the cruise line industry is much more complex than starting with high prices and if necessary lowering them through the booking cycle to eventually fill up the ship. While most sailings had lower average prices later in the booking cycle, the distribution of discounts and premiums also varied dramatically. As demonstrated in Figure 1, prices late in the booking cycle ranged from 55% below the early prices to 35% above the early prices.

## 2. Transparency

Cruise ship transactions prices are not available on computer reservation systems. With the large number of prices at any given time, it would be extremely difficult for cruise lines to track them all. Furthermore, while some prices are visible to competitors, such as brochure

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<sup>57</sup> The Travelocity website will give prices for cruises and airfare from 189 different airports in the United States and Canada.

<sup>58</sup> Since we are limited to presenting public information, these figures are from David Scheffman’s presentation to the ABA M&A Committee on November 21, 2002 (<http://www.abanet.org/antitrust/committees/clayton/programs.html>). The entire presentation is available at <http://www.ftc.gov/be/hilites/ftcbeababrownbag.pdf>, where larger color versions of these charts are available.

prices or prices at internet travel agents, there are many other prices that are not easily accessible. Therefore, unless the prices that are not transparent are highly correlated with some transparent price, overall prices will not be transparent. For example, if average prices were consistently a fixed discount off of brochure prices, then a competitor would only need to know the brochure price. However, our analyses did not support this type of relationship between various types of prices.

Lack of transparency would make detection of cheating difficult. At first glance, it would appear that prices in the cruise industry are transparent. Each firm publishes brochures listing prices for the various types of cabins for the various itineraries it plans to sail. However, most passengers do not pay these prices. Furthermore, many passengers will buy a bundle that includes airfare or land-based add-ons which may or may not be priced in the brochure. The cruise line can set the price of the air add-on to raise or lower the effective price of the cruise. Many passengers also receive free upgrades, which is another way for cruise lines to discount prices on higher quality cabins. Another complicating factor is that discounts on group sales are not always transparent. Furthermore, it is possible for travel agents, which sell most tickets, to rebate a portion of their commission to close a sale. Therefore, a firm may not be able to determine whether a competitor is cheating or a travel agent has reduced the effective price on its competitors cruise. The cruise lines do expend significant effort to track at least some prices of their competitors for particular sailings. They will receive information from travel agents telling them about specials being offered by competing cruise lines and they will also do some of their own research on pricing through mock bookings. This data collection, however, only gives them sporadic information on pricing about a subset of cabins and price offerings. The information is not consistently used to respond to the pricing of competitors but appears to be a piece of information used by the cruise lines to understand the pattern of bookings that they are observing for particular sailings.

### **3. Incentives**

The various cruise lines would have different incentives to participate in any collusive equilibrium. One reason is that the products offered by the various cruise lines are differentiated in many ways, such as in the quality and configuration of their ships and the itineraries that they sail. These differences will make it much more difficult for the firms to agree on which prices to increase since each firm will differ in the fraction of customers of any given type. For example, 46% of Princess' cabins are balcony cabins while only 20% of Carnival's cabins are balcony cabins. These differences give each firm different incentives and reduce the likelihood that they would be able to reach consensus on how to change prices.

Variability of demand also creates differences in the incentives of cruise lines. This raises another difficulty in reaching consensus since any collusive agreement would need to decide how to react to unanticipated changes in demand. If demand falls, the firms will need to decide when to cut prices and how far. Furthermore, since demand is unlikely to fall evenly, it is unlikely that the firms could reach consensus ahead of time on how to react to the many different ways that demand could change. Since the demand changes are uneven, the firms would also have different incentives to deviate from the original collusive arrangement.

### C. Specific Analyses Relevant to Assessment of the Potential for Coordinated Interaction Effects on Price Arising from the Proposed Mergers

We conducted many different analyses to determine whether the market conditions were conducive to coordinated interaction on price, either before or after the merger.<sup>59</sup> These analyses often shed light on more than one of the above elements. Some examples of these analyses are presented below.

#### 1. Analyses of Head-to-Head Cruises

We conducted a number of analyses of the prices and “fill-rate” over the booking cycle of head-to-head cruises, *i.e.*, specific cruises of the four major competitors that had similar ships on these cruises, leaving on the same day with approximately the same itinerary. Figure 2 provides one example of this analysis. The lines track average prices each month (the months are “months before sailing”) of the booking cycle for a specific cabin type and the bars plot the sales for each month. For example, the average price per day for ship A for passengers that purchased their ticket five months prior to sailing was just over \$125, and 10% of the passengers on that sailing purchased their tickets that month. Figure 2 shows that the pattern of prices and booking is quite different across the head-to-head cruises.

It is quite striking how relatively unrelated are these head-to-head prices. This analysis indicates that pricing decisions for an individual sailing are not primarily driven by competitors’ pricing. Given the details of the generation of sales, this is not surprising. Cruises are sold by travel agents, and across most of the country. Prices differ to some extent across some locations at a given time (but with no consistent pattern over different cruises or seasons). A given cruise line may be working with travel agents in Cleveland in a given week or month to push sales, whereas a competing cruise line with a head-to-head cruise might be working with travel agents in Atlanta.

What we found from our many empirical analyses of transactions prices was consistent with what we learned from the cruise lines documents and executives – pricing decisions during the booking cycle are determined by a number of complex factors, bookings relative to expected bookings perhaps being the single most important. Briefly, prices may be changed relative to the target price if bookings are running substantially ahead or behind expected levels. A shortfall of

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<sup>59</sup> We describe some of those analyses in what follows, including some examples. Although we had more than 100 gigabytes of data, the data were quite complex (involving transactions data files from a number of companies), and the market setting greatly added to the complexity. There was a fundamental tradeoff between taking account of very important market complexities and the complexity of the data and utility of simple (or complex) regression models. Although we performed various regression analyses, we found that for the purpose of assessing the potential for coordinated interaction in this complex market setting, relatively straightforward data analyses such as cross-tabs, summary statistics, and innumerable graphical depictions of the data were generally the most useful. However, we only had a few months to develop data analyses during the period of the investigation. (This is a fundamental issue for FTC economists – come up with useful, reliable analyses using very messy data in a complex setting under tight time constraints). We hope that this paper will stimulate further ideas on quantitative analyses that can be useful in the analysis of the potential for coordinated effects arising from a merger.



bookings *may* be due to competitor pricing but a shortfall can arise from a number of factors (e.g., soft demand) as well. As a result, competition has only a limited impact on pricing.

Finally, we also ran regression models to test more systematically whether prices on individual sailings reacted to prices on other sailings of similar cruises. The results, although crude, indicated that competitors' prices did not have a significant impact on prices for individual sailings. There was an indication that prices were sometimes related to the level of cumulative booking.

This suggests that the incentives faced by various competitors at any point in time with regard to pricing would differ, making coordination quite difficult. Figure 2 and many similar analyses also indicate the relative lack of importance of head-to-head competition in pricing, which, itself, raises questions about the importance of the loss of head-to-head competition on pricing between the parties to the merger. Put simply, on any given itinerary and date of departure, the competitors are trying to fill up their ships over the booking cycle – competitors' prices are just one factor influencing how any particular competitor is going to price or change its prices over the booking cycle.

## **2. Analyses of Similar Cruises of Same Company**

In another set of analyses, we looked at the pattern of prices over the booking cycle of what appeared to be similar cruises of the same cruise line. For example, one analysis looked at whether the same ship sailing on successive weeks had similar pricing patterns. Figure 3 provides an example of this type of analysis. This chart represents prices and sales for four individual cruises on the same ship sailing similar itineraries in consecutive weeks. As in Figure 2, the lines plot the average prices each month before sailing for one category of cabin, while the bar charts represent the sales during that month. Figure 3 demonstrates that the pattern of prices and bookings varies significantly across these four proximate sailings. This analysis shows that similar sailings cannot be grouped together to reduce the complexity of pricing in the cruise ship industry.

## **3. Analyses Relevant to Brochure or “Early” Price Theories**

The number of and transparency prices and complexity of coordination could be reduced if there was a set distribution of discounting off some set of transparent “early” prices. While we refer to the price as the “early” price, many passengers that booked early paid less than this amount, and many passengers that booked late booked at this price. If this distribution was stable, the argument was that firms would only need to coordinate on this “early” price, or possibly the brochure price (if early prices were predictably related to brochure prices), and the other prices would follow along. Alternatively, if there was a consistent group of people that paid this “early” price, this group could be a targeted group of consumers for a price discrimination market. One problem with this (and most theories of targeted price discrimination) was that most early bookings cancel without penalty. Consumers can arbitrage over time, and the cruise lines are quite cognizant that this is a reality of their bookings.

One potential theory we pursued was whether prices could be elevated if there was some sort of tacit coordination with respect to brochure prices<sup>60</sup> and if later transactions prices were significantly related to brochure prices. There were a number of issues in testing this theory. First, even early bookers typically pay less, often significantly less than the brochure prices. Second, it is not clear how the merger would impact such the ability to coordinate these prices. If competitors were “signaling” through pre-season brochure prices, why would the merger change anything? There was no evidence that one or more parties were “mavericks” in brochure prices that because of their aggressiveness resulted in a reduction in competitors’ brochure prices. In any event, the above analysis shows that this theory was unlikely to be viable since the overall distribution of prices varied so much from sailing to sailing and therefore was not correlated to brochure prices.

After rejecting a brochure price theory, we turned to an “early” price theory. The idea here was that *transactions* prices early in the booking cycle might provide some sort of “anchor” for later prices. To examine the relationship between early and later prices,<sup>61</sup> we analyzed transactions prices for consecutive sailings of the same ship, as well as the sailings of the same ship in the same week in consecutive years, to see if the distribution of “discounts” off the “early” prices were consistent. Figure 4, which is one example, demonstrates that the relationship between early and later prices shows no stability over four consecutive sailings of the same ship on similar itineraries. The figure shows the percentage of passengers for a single cabin type that purchased tickets at various levels of discounts.<sup>62</sup> Figure 5, which is one example, demonstrates that the amount of “discounting” varied significantly during the same week in three consecutive years. Since there were not consistent patterns or numbers of people paying the “early” price, it seemed unlikely that firms could use these prices as a reference price to coordinate their overall prices.

#### 4. Analyses of “Early” vs “Late” Bookings

Another theory of how the firms could coordinate to increase prices to a subset of consumers was that firms could increase prices to passengers that booked their cruise early.<sup>63</sup> The logic was that passengers that booked early could be more inelastic since they wanted to make sure that they got tickets for their desired vacation. Furthermore, since discounting often occurs relatively late in the booking cycle,<sup>64</sup> prices on average were lower closer to sailing. However, this strategy would require the firms to lower prices later in the booking cycle if the

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<sup>60</sup> Brochures are typically produced prior to the beginning of the booking cycle.

<sup>61</sup> We used various definitions of “early” prices.

<sup>62</sup> These “discounts” were rounded to the nearest 5%. Some passengers paid “premiums” relative to “early” pricing on some sailings.

<sup>63</sup> A significant issue with this theory was that there were usually no cancellation penalties for early bookers. Thus, the cruise line would have to be able to keep early bookers from “rebooking” to the lower prices. This might occur if information on lower prices were not readily available, if there were some cost to passengers of waiting to book (such as lower likelihood of obtaining a preferred cabin) or if lower prices were only offered to passengers booking geographic areas where there were low current booking rates.

<sup>64</sup> Firms will also have early booking discounts.

firms still attempted to sail full. Increasing the price early could drive some passengers out of the market, but combined with increases in discounts later on would also give passengers an added incentive to book closer to sailing. Pushing passengers to book later would also increase the uncertainty that the firms have on what the actual demand is for their cruises.

One analysis that we did to see if this theory was plausible was to look at average prices early and late, as well as the number of passengers that booked in these periods. If the pattern of discounting and the number of passengers that booked early versus late was fairly consistent, then coordination might be possible. However, the number of passengers that booked early varied dramatically. As demonstrated in Figure 6, the number of passengers that booked more than 120 days prior to sailing varied from 0% to 100%. For example, the chart shows that for 7% of sailings, 45% of passengers booked at least 120 days prior to sailing, while for 3.5% of sailings, only 20% of passengers booked at least 120 days prior to sailing. Since the natural variation in the number of passengers is this high, there does not appear to be a predictable group of passengers that will book early that could be discriminated against. Furthermore, this variation in the number of passengers that book early will make it very difficult for a cruise line to determine if its ship is suffering reduced demand due to normal variation or due to its competitors cheating and lowering early fares.

#### **D. Price Coordination Conclusions**

The results of the various analyses were consistent with the fact that for different sailings, a passenger's next best alternative could vary widely. For a passenger that wants to sail in a balcony cabin on the Carnival Destiny leaving San Juan for a seven-day southern Caribbean cruise on January 4, 2004, the next best alternative could be an ocean view cabin on the same voyage, the January 11, 2004 sailing of the same ship in a balcony cabin, or the January 4, 2004 sailing of either of the Royal Caribbean Adventure of the Seas or the Norwegian Sky. Alternatively, the passenger's next best alternative could be to spend that week in Jamaica, or even to stay home and buy a new car. Without any consistent ranking of alternatives across passengers, the prices of what appear to be similar vacations would not be highly correlated. As a result, it would be very difficult, even for a monopolist, to price discriminate through some simple application of yield management (particularly because of the high cancellation rate for bookings), let alone for firms with different incentives to reach consensus on how to increase prices and detect cheating. Without the ability to price discriminate, as indicated by the critical loss analysis, the market would be broader than just vacations on cruise ships.

Another potential difficulty in detecting cheating is that, as mentioned above, not only is the demand for cruises variable, demand does not appear to vary evenly across firms, or even across sailings of the same ship or cruise line. Indeed, the demand for individual cruises appears to be highly idiosyncratic. As shown in Figure 2, prices for cruises that one would expect to be very close substitutes do not appear to be highly correlated. Therefore, if a company sees that its sales on a particular voyage are lower than expected, it may be very difficult to determine whether the lower sales are due to a competitor cheating on the collusive agreement or the reduced sales are due to some idiosyncratic change in demand. As a result, a firm's own sales cannot be used to detect cheating.

## **VIII. Potential Competitive Effects: Capacity Coordination**

### **A. Overview**

In addition to considering whether coordination directly on price was likely, we considered whether capacity coordination was feasible as a means to increase prices currently or at some point in the near future. That is, could the major cruise lines reduce capacity and cause prices to rise either by reducing future capacity additions or repositioning current capacity?

Several features differentiate this analysis from the price coordination analysis. First, transparency is not as significant an issue. New ship orders and ship itineraries are announced well in advance and the information about such orders and itineraries are readily available. Thus, firms would likely be able to detect deviations from the coordination outcome.

Second, whether the firms (as a group or individually) would have the incentive to go along with coordination is a significant issue. The industry has been growing significantly through capacity expansions and whether it would be profitable to slow down this expansion was uncertain. Thus satisfying the “consensus” component of coordinated effects may be difficult.

Third, how the punishment prong would be satisfied is unclear. How would one punish deviations from coordination on capacity? Building more capacity to punish has several problems. Once built, the capacity cannot go away (even bringing in a ship temporarily will have a lengthy effect as ships do not move across trades within a season easily as repositioning cruises generally are not very profitable). Thus, such a punishment would not be a credible threat. Moreover, it would not be possible to target easily the firm cheating as all the firms compete in all the itineraries.

Fourth, as discussed previously, demand as a whole for cruising appears to be relatively elastic (with a best estimate elasticity of at least -2). Thus, a significant amount of capacity would have to be removed to have a meaningful impact on pricing. This means reducing capacity by a number of ships to cause prices to go up (likely at least 15 ships averaging 1500 passengers to have a 5% impact). Determining exactly how such a reduction would occur and in what trades and by which companies would be complex.

Finally, the capacity reduction theory anticipates an effect in the future when ships not currently under order would have been built but for the hypothesized coordination, come on line and impact pricing. The further out the potential effect, the more speculative becomes the argument.

### **B. Analyses for the Future Capacity Reduction Theory**

As noted, an important issue in assessing whether capacity coordination with regard to future capacity reductions was likely was to consider whether firms would have the incentive collectively or individually to reduce capacity in the foreseeable future. Capacity had been expanding in the industry at a rapid pace with limited impact on price and there were significant new capacity expansions on the way. In addition, new ships with expanded amenities provided news for the industry and helped to increase demand. These factors suggest that the industry had

not yet met the demand for cruising and that continued expansion, at least in the near term, was likely to be profitable for the industry.

To address this issue, we developed a pro-forma model for the profitability of adding a new ship for the industry as a whole and for individual cruise lines, taking into account the impact on pricing from existing ship orders and the cannibalization effect on pricing from the addition of a ship. As inputs into this model, we used financial data on revenues and costs from actual experiences of new ships in the recent past and assumptions on the impact of additional capacity on prices. That is, we adjusted the revenues from the actual experience of previous new ships downward to take into account that the possible new ship under consideration would be launched when there was substantial other new capacity in the market. We also subtracted from the new ship's revenues the loss in revenues for other ships owned by the firm under consideration (or all other ships if we looked at the industry as a whole) caused by the addition of the capacity of the new ship.

Our analysis showed that adding a new ship was profitable not only for individual firms in the industry but for the industry as a whole.<sup>65</sup> While clearly at some point, new ship additions would not be profitable for the industry, this analysis suggested that the current marginal incentives are to add capacity particularly for individual firms. Thus, firms would have a substantial incentive to cheat on any coordination scheme, particularly since, as noted, punishment would be difficult (and not very timely) and building new ships is a way of differentiating oneself from competitors.

We also analyzed the commitments to new capacity that existed, whether such commitments could be modified and when the impact of capacity coordination, if it were to occur would happen. We found that there were substantial commitments to new capacity that would be coming in the next several years and more were announced during the course of our investigation. These commitments would be difficult to cancel. Thus the theory would involve a reduction in orders in the future for ships not yet planned and that would not be launched for at least 4-5 years. Moreover, to have a significant impact on price, several fewer new ships would have to be ordered, further making it difficult to achieve a coordinated outcome. Any such theory was considered far too speculative to provide the basis for challenging the merger.

In addition, given the long term nature of the theory of competitive concern, entry and expansion by the fringe was an important issue, particularly since reducing future ship orders would free up space at shipyards for other firms. Smaller cruise line competitors have added new ships and have plans for additional expansion. In addition, cruise lines that had traditionally targeted European passengers had announced plans to try to get more North American passengers, not only when they sailed in the Caribbean but also when they sailed in Europe. Expansion or entry would only seek to undermine a coordinated outcome (even if such entry or expansion could not entirely offset a capacity reduction by the main cruise lines, it would make a reduction less profitable and thus coordination less stable).

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<sup>65</sup> We have not provided details of our analysis because it contains confidential information that cannot be revealed.

All of these factors, when taken together, suggested that a coordination argument involving future capacity reduction was not sustainable. It is not clear that the major cruise lines would have the incentive to reduce future capacity additions. Even if they did, the existing commitments to expanding capacity would mean that any such theory would involve reductions in new ship orders several years in the future that are not even planned. Finally, the potential for entry or expansion by other cruise lines would further undermine any incentives for coordination.

### C. Analyses for the Capacity Repositioning Theory

The capacity repositioning theory considered whether the major North American cruise lines would move capacity out of North America (to Europe or Asia) to target non-North American passengers, thus raising prices in North America. As a starting point, any such repositioning would be very complex as it would involve coordination over which ships to move from which trades and to where. Given that a significant number of ships would have to move, accomplishing this would not be easy. However, abstracting from these issues, we tried to assess whether such repositioning would be profitable.

To do so, we conducted a variant of a critical loss analysis. That is, we modeled the net impact on profits from moving ships, determined by (1) the gain in profits on the ships remaining in North America; (2) the lost profits on the ships moved (taking into account the impact on prices at the new location of adding significant new capacity); and (3) what would the lost profits on ships already in the area where the repositioned ships will be moved. This analysis first assumed no repositioning of ships by other cruise lines back to North America.<sup>66</sup> The important components for this analysis include: (1) the number of ships would have to move to achieve a small but significant price increase; (2) the margins in the two areas currently; (3) the size of the capacity increase in the new area would result from moving ships into that area; and (4) the impact of this capacity increase on prices in that area.

Our analysis showed that a repositioning that has a meaningful impact on price in North America would not be profitable.<sup>67</sup> There are several reasons why this is so. First, many ships would have to be moved from North America to achieve a meaningful price impact. For instance, at least nine average size ships<sup>68</sup> would have to move to result in a 5% price increase. Second, North American capacity is much greater than capacity elsewhere. It is approximately 2½ times greater than capacity in Europe and over ten times greater than capacity in Asia. Thus a 10% reduction in capacity in North America equates to a 25% increase in capacity in Europe or over a 100% capacity increase in Asia. Even assuming margins and elasticities in North America, Europe and Asia are the same currently, such a movement would result in a substantial reduction in margins in these areas - over 12% for Europe and over 50% for Asia. Finally, the major North American cruise lines already have (as a group) significant capacity in Europe and Asia. Thus, reducing margins in those areas not only affects the profits of the ships to be repositioned but also the profits of ships already in those areas. Moreover, the ownership of

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<sup>66</sup> We also assessed the impact of such repositioning.

<sup>67</sup> Again, we do not provide details of this analysis because it incorporates confidential information.

<sup>68</sup> The average ship in the North American fleet carries 1681 passengers. Using an elasticity of -2, a 5% price increase would require a 10% capacity reduction, or 15,800 berths.

capacity varies across the cruise lines and thus the incentives for repositioning capacity will differ. This result is not to say that firms will not move ships among their lines - they will seek what look to be the most profitable locations for their ships. However, it is unlikely that firms could profitably coordinate to reposition ships to achieve a meaningful price increase in North America.

Making repositioning more unlikely is the ability of firms to expand by building more ships or European firms to reposition their own ships. Most European lines already have a number of North American passengers on their existing itineraries. They could undermine a coordination outcome by targeting more North American passengers and sailing on more North American itineraries. These types of transfers have occurred in the past. For example, Star has transferred ships from Star, its Asian cruise line, to Norwegian, its North American cruise line.<sup>69</sup> Royal Olympic Cruise Lines has also moved some of its ships to North America and attempted to market them to North American passengers. In addition, such firms (as well as smaller North American firms) could build more ships and undermine the coordination. Moreover, even the members of the coordination group could undermine the coordinated outcome through building new ships and putting them in North America.

## **IX. Conclusion**

This paper should provide better understanding of the sorts of analyses FTC economists conduct in connection with FTC merger investigations. Before summarizing the conclusions of our investigation, we would like to comment on the data production in this case. The cruise ship investigation demonstrated how cooperation on data issues can be beneficial to the investigation. Working with the parties to see what types of data are kept, what format is easiest to produce the data, and what format the Commission could receive the data, helped ease the data requests in this investigation. Without the detailed transactions level data submitted early in the investigation (well before compliance with the second request), many of the analyses presented here would not have been possible before the Commission needed to make a decision. Negotiating the data requests also helped create a dialogue about economic analyses between the parties and the Commission staff as the Commission staff attempted to explain why certain types of data would be useful, and the parties attempted to explain how they use the data in the ordinary course of business. Furthermore, since both sides were working from common data, later substantive discussions were more useful.<sup>70</sup>

The investigation concluded that while cruise ships may be a defensible, but novel and complex product market, that the evidence supporting that market was weak. Furthermore, to

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<sup>69</sup> The Norwegian Sun and the Norwegian Dawn were originally part of the Star Cruises fleet, which is marketed to Asians, but were transferred to the Norwegian fleet, which is marketed to North Americans, after Star purchased Norwegian in 2000. After September 11, Star cancelled the transfer of the Norway from the Norwegian fleet to the Star fleet since the Asian market was weaker than the North American market. Star was also going to transfer a smaller ship to its Orient line, which is marketed to North Americans, but the net effect was to keep capacity in the North American market that it had planned to move to the Asian market.

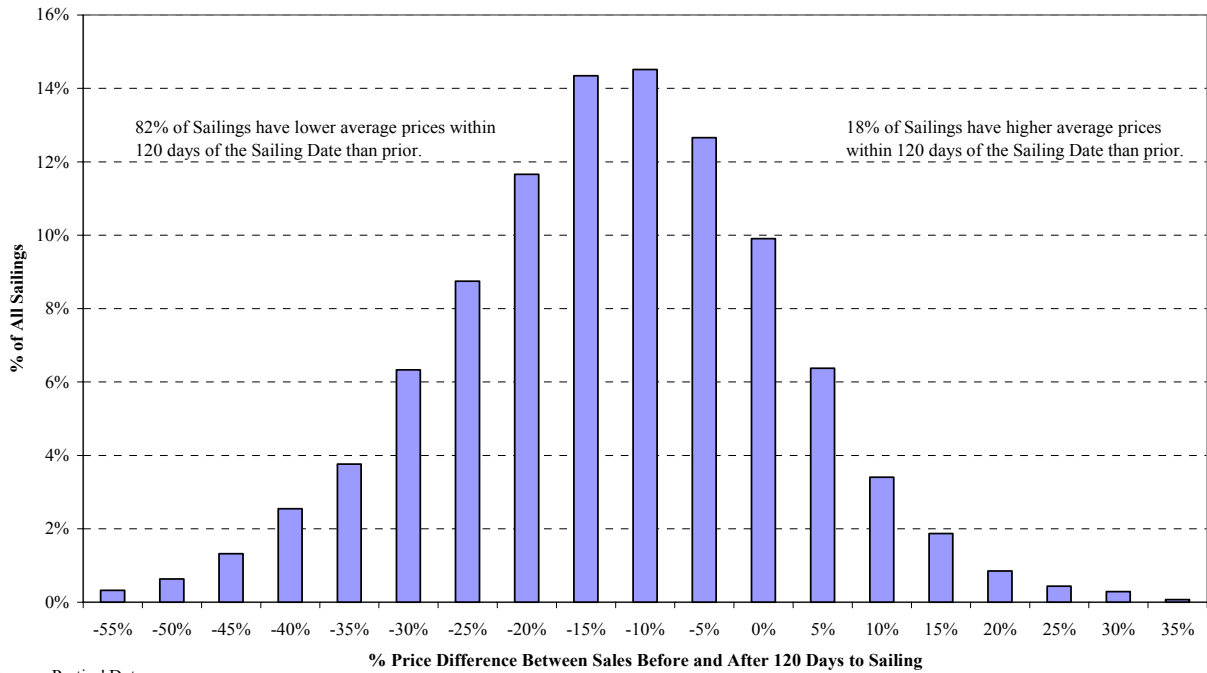
<sup>70</sup> See <http://www.ftc.gov/be/bestpractices.pdf> and <http://www.ftc.gov/be/ftcbebp.pdf> for a discussion of suggested best practices.

support the market, the hypothetical monopolist needed to be able to price discriminate. While a cruise ship product market would be highly concentrated post-merger, these product market weaknesses impacted the assessment of potential competitive effects of the proposed mergers. Furthermore, although the product market was based on a presumption that a monopolist could successfully engage in anticompetitive price discrimination relative to the *status quo*, this presumption was not supported for an industry that would have three major and a number of smaller competitors, post-merger.

The numerous analyses done during the investigation did not provide support for the various potential anticompetitive theories. The evidence did not support a viable theory of unilateral effects. A large number of analyses of voluminous transactions data, along with a great deal of qualitative evidence, led to a conclusion that the mergers were not likely to lead to anticompetitive effects via coordinated interaction either with respect to prices or capacity. More generally, there is much more work to be done by economists that can shed light on the potential competitive analysis of mergers. One very important line of research is to conduct retrospective analyses of mergers that have not been challenged. FTC economists are conducting a number of such analyses. Another important line of research is to develop more quantitative methods that use the data typically available in a merger investigation and that can provide reliable inputs into the assessment of the potential competitive effects of mergers.

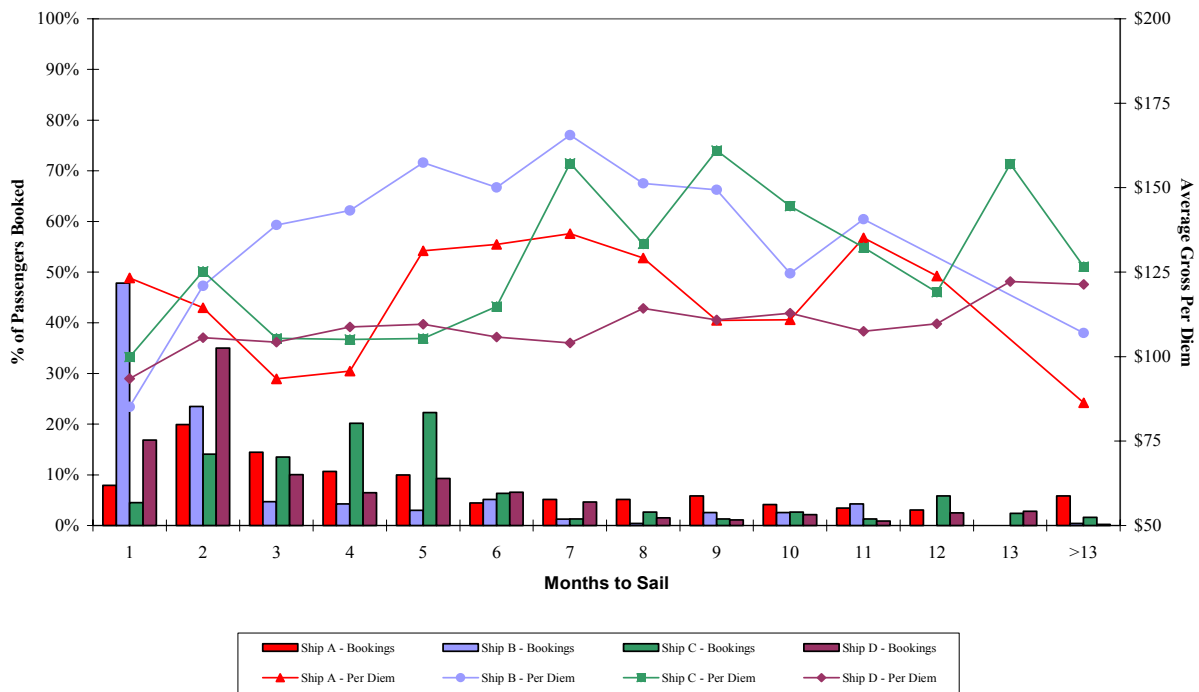


**Figure 1: Relative Pricing Before and After 120 Days to Sailing  
All Cruises - All Cabins**

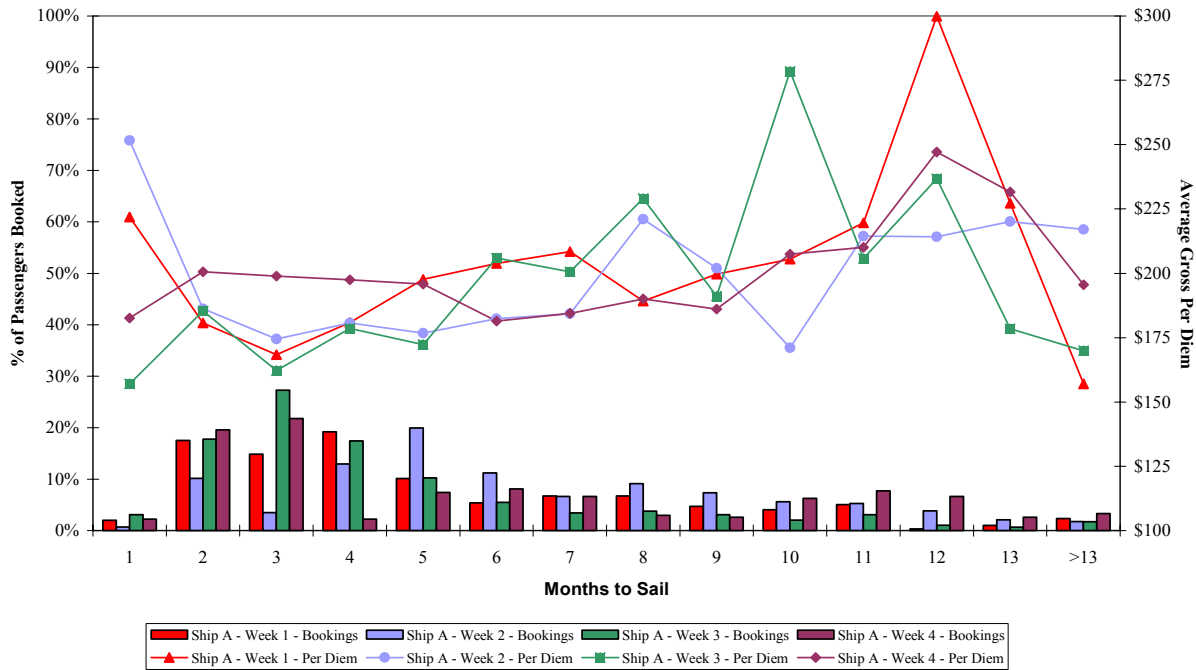


Source: Parties' Data

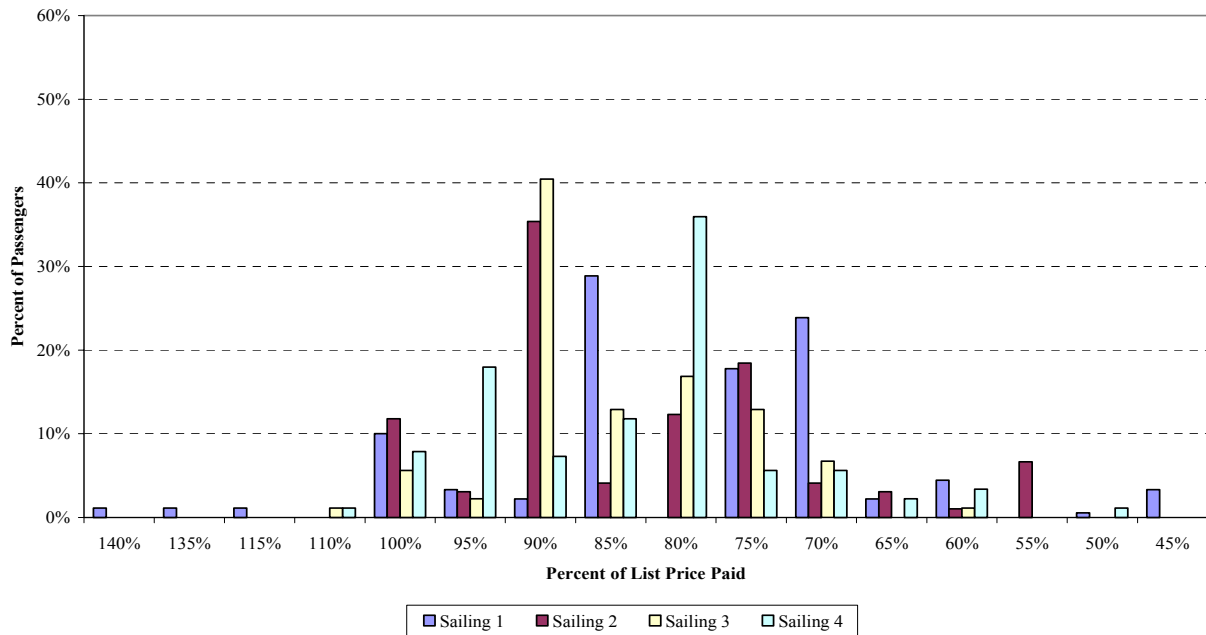
**Figure 2: Average Gross Per Diem and Bookings by Month Prior to Sailing  
for Four Ships Departing the Same Port on the Same Day Sailing Similar Itineraries  
(Category X Cabins)**



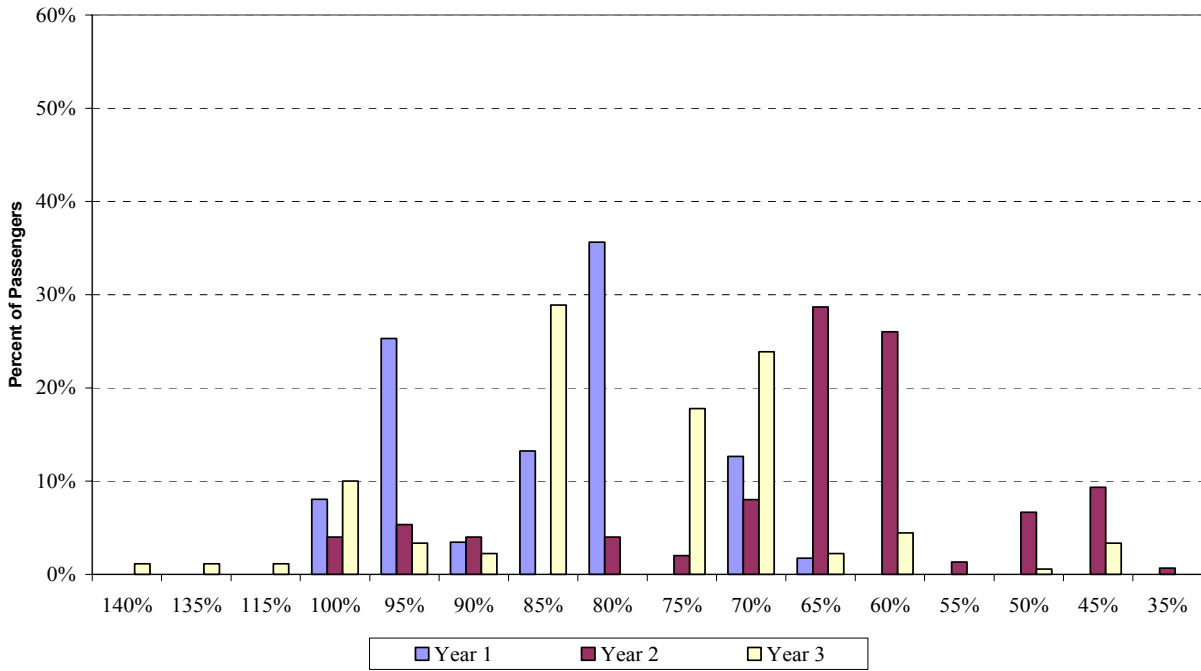
**Figure 3: Average Gross Per Diem and Bookings by Month Prior to Sailing on Similar Itineraries for Four Consecutive Weeks (Category X Cabins)**



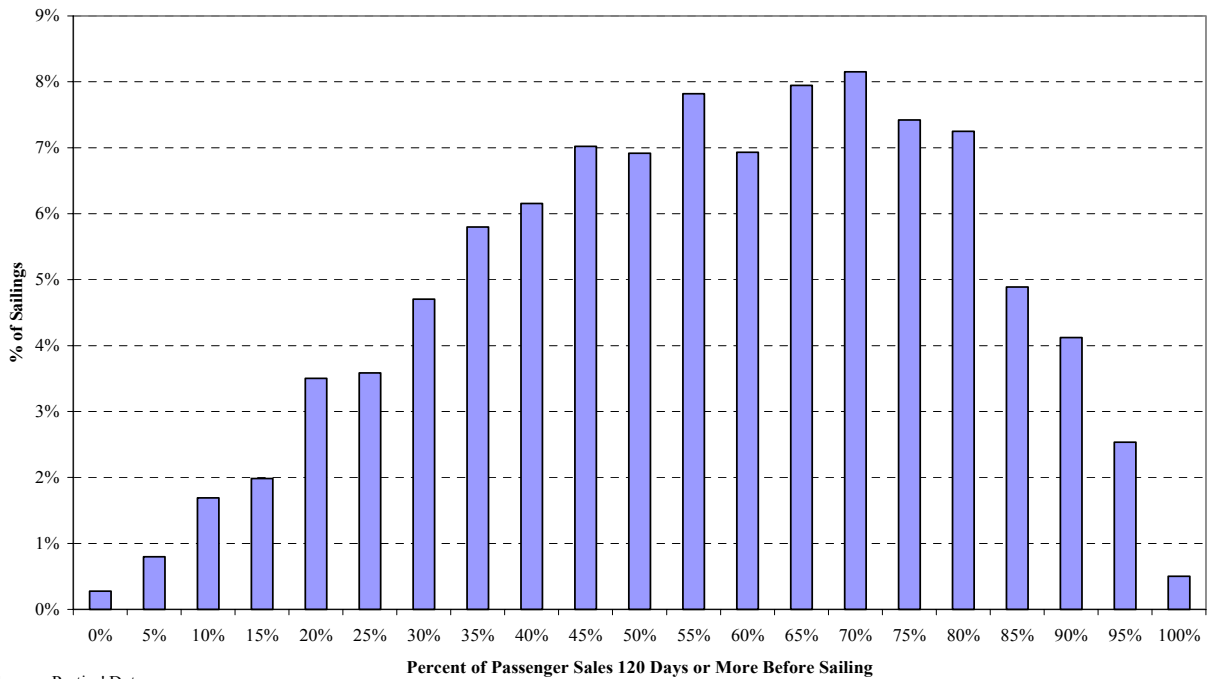
**Figure 4: Distribution of Passengers Paying Rounded Percentage of “Early” Price for Four Consecutive Sailings of Ship A, for a 7 Day Cruise, Category 1 Cabins**



**Figure 5: Distribution of Passengers Paying Rounded Percentage of “Early” Price, for Three Identical Sailings of Ship A, in Three Consecutive Years, Category 1 Cabins**



**Figure 6: Distribution of Percent of Capacity Filled at 120 Days Before Sailing Across All Sailings**



Source: Parties' Data